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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/740,994 | 12/21/2000 | Masahito Nakamura | 106145-00012 | 5463 |

7590 07/30/2004

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| EXAMINER |
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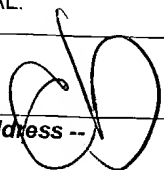
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| ART UNIT | PAPER NUMBER |
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1764

DATE MAILED: 07/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------------|---|
| Office Action Summary | Application No. 09/740,994 | Applicant(s) NAKAMURA ET AL. | |
| | Examiner N. Bhal | Art Unit 1764 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>2-6-2001</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

2. Claims 1-3 and 5-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Tachihara et al. [USP 6,617,067]

Tachihara et al. teaches a fuel evaporation chamber which produces fuel gas by vaporizing raw fuel liquid by a high temperature thermal medium to provide raw fuel gas, the evaporation chamber includes a plurality heat medium tubes (12) through which a high temperature heat medium passes, a raw fuel injection portion that injects raw fuel liquid onto the heat medium is situated in the evaporation chamber (11). Specifically, the vapor tubes are serially connected in the sense that there is a straight-line flow through the tubes and that the tubes are inclined between 3-10 degrees. Figures 12 and 13 specifically show that the arrangement of the evaporation chambers or tubes, which are serially connected. The fuel evaporator includes at least one raw fuel injector (40) for injecting the raw liquid fuel. Further included is a controller for controlling the raw fuel injector as claimed. [Note Figure3, abstract and Column 13, lines 25-65 and Column 14, lines15-65]

The applied reference has a common assignee as well at least one common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of

this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

3. Claims 1-3, 5-10 and 21- 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Tachihara et al. [USP 6,536,748]

Tachihara et al. teaches a fuel evaporator raw fuel injection apparatus 40A which includes an evaporator having an evaporating chamber 11 in which raw fuel liquid is evaporated by a high temperature heating chamber into raw fuel gas. Specifically the evaporator body (1) has an evaporating chamber (11) formed therein which evaporates the raw liquid fuel by the heat received from heating gas, the evaporating chamber includes a plurality of U-shaped heat medium tubes (12) through the heating gas flows. The liquid fuel injector or injectors comprise three fuel injection portions (41 ABC) and three air injection portions (42 ABC), which are controlled by a controller. The three fuel injection portions are arranged in a specific manner, which includes some being arranged above the evaporator body, and they inject the raw fuel toward the heat medium tubes (12) in the evaporation chamber (11). The fuel injection portions (41A) is situated above the evaporation chamber 11 and at the curved ends of the heat medium tubes (12) also the fuel injections portions (41A) is oriented at a slant in order to accomplish the injection at the curved ends of the heat medium tubes. [Note Column 6, lines 5-65]

The applied reference has a common at least one common inventor as well as same assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection

under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 4 and 11-20 are rejected under 35 U.S.C. 103(a) as being obvious over Tachihara et al. [USP 6,536,748 or USP 6,617,067]

Tachihara et al.'748 or '067 teach the inventions substantially as claimed by teaching a fuel evaporator for a fuel cell which includes an evaporation chamber which evaporates a raw liquid fuel by a high temperature thermal medium to provide a raw fuel gas, the evaporation chamber comprising a plurality of evaporation chambers serially connected to each other in a ventilation manner and at least one raw liquid fuel injector

for injection the raw liquid fuel being provided on each of the plurality of evaporation chambers as fully explained in the above paragraphs.

However, Tachihara et al. does not teach specifically how the controller is controlled for the raw liquid fuel injection which receives a signal from the raw fuel gas indicators and then selects the raw liquid fuel injector or injectors from which the raw liquid fuel is injected nor specifically that the evaporation chamber includes a controller which controls the gas temperature which controls the temperature of the raw fuel gas transferred from the evaporation chamber by means of heat exchange with high temperature thermal medium.

Tachihara et al. ['748 and '067] teach providing a controller for controlling the fuel injectors. Tachihara et al. ['748 and '067] teach that there is provided a controller which controls the temperatures, indicates temperature, which ensures the heating medium tubes are hot, and further includes indicating means to ensure proper heat exchange through out the fuel evaporator and fuel injectors. Tachihara et al.'748 teach controlling the air to fuel from the fuel injector and placement of the fuel injectors relative to the heating medium tubes within the fuel evaporator to provide proper heat exchange. To specifically provide the controller to control the heat exchange properties in the fuel evaporator and fuel injector to provide an efficient heat exchange and fuel systems would have been obvious to one having ordinary skill in the art at the time the invention was made because there is not only a suggestion but an implicit teaching that the heating mediums within the tube, the catalytic convertor placement prior to the evaporator, the evaporation conditions of the heating medium tubes, arrangement, fuel

injector arrangement and control of the fuel injector and evaporation are all known components of the fuel evaporation/fuel injection system of a fuel cell arrangement which requires control and specific design to provide an efficient heat balanced and controlled system. Thus it is maintained that the teachings of Tachihara et al. ['748 and '067] render applicant's invention as a whole obvious to one having ordinary skill in the art at the time the invention was made.


The applied reference has a common one common inventor and/or assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakamura et al. teach a fuel evaporator which includes an evaporation chamber to prepare a fuel gas. JP 2001-650424 teaches a fuel evaporator for a fuel cell which has gas temperature control chamber which exchanges and regulates the temperature of hot gas generated by evaporating fuel.[Abstract Only] JP2002231279 teaches a Vapor temperature control device for raw fuel evaporator in a fuel cell device. EP 1 160 902 teach a fuel cell system comprising a fuel tank for storing fuel, and evaporator (12) for evaporating the fuel to generate fuel gas and a reforming reactor for generating reforming gas containing hydrogen from the fuel gas.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Bhat whose telephone number is 571-272-1397. The examiner can normally be reached on Monday-Friday, 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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